

CLAIMS

What is claimed is:

5 1. An insulating concrete form, the form comprising:

first and second substantially opposing panels, each panel having a top surface, bottom surface, first end surface, second end surface, an exterior surface defining a wall and an interior surface for receiving concrete, with the first end surface and second end surface of the first panel and second panel having both a tongue and groove, disposed such that on the first end surface of the first panel the tongue is proximal the exterior surface and the groove proximal the interior surface, on the second end surface of the first panel the groove is proximal the exterior surface and the tongue proximal the interior surface, on the first end surface of the second panel the groove is proximal the exterior surface and the tongue proximal the interior surface, on the second end surface of the second panel the tongue is proximal the exterior surface and the groove proximal the interior surface, the panels disposed such that the first end surface of the first panel opposes the first end surface of the second panel and the second end surface of the first panel opposes the second end surface of the second panel; and

at least two ties interconnecting the first panel and the second panel,

20 whereby two or more forms may be horizontally positioned and interlocked to form a planar surface by means of a joint formed by both a tongue and a groove on each panel of one form interconnecting with a groove and a tongue on each panel of another form, the forms being reversibly connectable such that the first end surface of the first and second panels of one form may be joined with either the first end surface or the second end surface of the first and second panels of another form.

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2. The form of claim 1, wherein the top surface of each of the first and second panel having a tongue or a groove, and the bottom surface of the first and second panel having the complementary tongue or groove, whereby two or more forms may be vertically stacked and interlocked to form a planar surface by means of a joint formed by a single tongue on each panel of 30 one form interconnecting with a single groove on each panel of another form.

3. The form of claim 1 wherein the panels comprise a polymeric material.
4. The form of claim 1 wherein the exterior surfaces of the first panel and second panel
5 each form a single plane.
5. The form of claim 1 wherein the exterior surface of at least the first panel forms two planes, the two planes intersecting at an angle to form a vertical line.
10 6. The form of claim 5 wherein the angle is a right angle or a forty-five degree angle.
7. The form of claim 5 further comprising a metal strip on each plane adjacent the intersection, parallel to the exterior surface of and forming a vertical attachment stud, a portion of the metal strip extending into the interior surface for receiving concrete.
15 8. The form of claim 1 wherein the tie comprises a welded wire tie.
9. The form of claim 8 wherein each tie comprises at least three parallel horizontal wires arranged in a single plane, the wires spaced distances apart such that the total distance from
20 the bottom-most horizontal wire to the top-most horizontal wire is less than the height of the two opposing panels, each wire being of a length greater than the distance between the exterior surfaces of the two opposing panels, with an equidistant right angle on each end of each horizontal wire, positioned such that each right angle bend is disposed between the exterior surface and the interior surface of a panel;
- 25 at least three parallel vertical wires arranged in a single plane, the wires spaced apart and arranged so as to be disposed within a distance less than the distance between the right angle bends on each end of the horizontal wires, each wire being of a length at least equal to the total distance from the bottom-most horizontal wire to the top-most horizontal wire;
the at least three horizontal wires and at least three vertical wires disposed such that each
30 horizontal wire touches and forms a right angle intersection with all vertical wires, and each vertical

wire touches and forms a right angle intersection with all horizontal wires, the wires being welded one to the other at each intersection; and

a metal sheet disposed within the interior of right angle on each end of the horizontal wires, at least a portion of the metal sheet being substantially parallel to the exterior surface of the panel
5 wherein such right angle is disposed, each metal sheet being in contact with each horizontal wire and welded thereto.

10. An insulating concrete form, the form comprising:

first and second substantially opposing panels, each panel having a top surface, bottom
10 surface, first end surface, second end surface, an exterior surface defining a wall and an interior surface for receiving concrete; and

at least two ties for interconnecting the first and second substantially opposing panels, each tie having a plurality of horizontal wires and a plurality of vertical wires, wherein each horizontal wire in a tie touches and is fixed to each vertical wire in the tie.

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11. The form of claim 10 wherein each tie comprises:

at least three parallel horizontal wires arranged in a single plane, the wires spaced distances apart such that the total distance from the bottom-most horizontal wire to the top-most horizontal wire is less than the height of the two opposing panels, each wire being of a length greater than the
20 distance between the exterior surfaces of the two opposing panels, with an equidistant right angle on each end of each horizontal wire, positioned such that each right angle bend is disposed between the exterior surface and the interior surface of a panel;

at least three parallel vertical wires arranged in a single plane, the wires spaced apart and arranged so as to be disposed within a distance less than the distance between the right angle
25 bends on each end of the horizontal wires, each wire being of a length at least equal to the total distance from the bottom-most horizontal wire to the top-most horizontal wire;

the at least three horizontal wires and at least three vertical wires disposed such that each horizontal wire touches and forms a right angle intersection with all vertical wires, and each vertical wire touches and forms a right angle intersection with all horizontal wires, the wires being fixed one
30 to the other at each intersection; and

a metal sheet disposed within the interior of right angle on each end of the horizontal wires, at least a portion of the metal sheet being substantially parallel to the exterior surface of the panel wherein such right angle is disposed, each metal sheet being in contact with the each horizontal wire and fixed thereto.

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12. The form of claim 11 wherein each vertical wire comprises a semicircular bend at the intersection with each horizontal wire, the circle defined by the semicircular bend having a radius approximately equal to the diameter of the horizontal wire, whereby the horizontal wires and vertical wires are substantially co-planar within the plane defined between the right angles on each end of the horizontal wires.

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13. The form of claim 11 wherein the horizontal wires are spaced distances apart such that the total distance from the bottom-most horizontal wire to the top-most horizontal wire is between about 75% and about 95% of the height of the two opposing panels.

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14. The form of claim 11 wherein the vertical wires are of a length between about 100% and about 110% of the total distance from the bottom-most horizontal wire to the top-most horizontal wire.

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15. The form of claim 11 wherein the wires are fixed at each intersection by means comprising a weld.

16. The form of claim 11 wherein the metal sheet is fixed to each horizontal wire by means comprising at least one weld.

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17. The form of claim 11 wherein a portion of the metal sheet is substantially perpendicular to the exterior surface of the panel wherein such right angle is disposed.

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18. The form of claim 11 wherein the first end surface and second end surface of the first panel and second panel have both a tongue and groove, disposed such that on the first end surface

of the first panel the tongue is proximal the exterior surface and the groove proximal the interior surface, on the second end surface of the first panel the groove is proximal the exterior surface and the tongue proximal the interior surface, on the first end surface of the second panel the groove is proximal the exterior surface and the tongue proximal the interior surface, on the second end

- 5 surface of the second panel the tongue is proximal the exterior surface and the groove proximal the interior surface, the panels disposed such that the first end surface of the first panel opposes the first end surface of the second panel and the second end surface of the first panel opposes the second end surface of the second panel;

whereby two or more forms may be horizontally positioned and interlocked to form a planar
10 surface by means of a joint formed by both a tongue and a groove on each panel of one form
interconnecting with a groove and a tongue on each panel of another form, the forms being
reversibly connectable such that the first end surface of the first and second panels of one form may
be joined with either the first end surface or the second end surface of the first and second panels of
another form.

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19. The form of claim 11, wherein at least four ties are provided, the ties positioned such
that the distance from a center line of each metal sheet to a center line of any adjacent metal sheet
is an equal distance.

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20. The form of claim 11, wherein the exterior surface of each panel further comprises
grooves marking the position of the metal sheet of each tie.